4015

National Library of Canada | Bibliothèque nationale du Canada

CANADIAN THESES ON MICROFICHE | THÈSES CANADIENNES SUR MICROFICHE

NAME OF AUTHOR/NOM DE L'AUTEUR DAVID C. FORSTER

TITLE OF THESIS/TITRE DE LA THÈSE The Relationship of Referential and Logical Text Cues and the Retention of Information of Average Fourth Grade Readers

UNIVERSITY/UNIVERSITÉ U. of A.

DEGREE FOR WHICH THESIS WAS PRESENTED/ GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE M. Ed.

YEAR THIS DEGREE CONFERRED/ANNÉE D'OBTENTION DE CE GRADE 1978

NAME OF SUPERVISOR/NOM DU DIRECTEUR DE THÈSE DR. W. T. FAGAN

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE DU CANADA de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans l'autorisation écrite de l'auteur.

DATED/DATÉ Oct. 19, 1978 SIGNED/SIGNÉ David C. Forster

PERMANENT ADDRESS/RÉSIDENCE FIXÉ 41 Livingstone Cr.
ST Albert, Alta.
T8N 2H2

NL-91 (3-74)

National Library of Canada

Cataloguing Branch
Canadian Theses Division

Ottawa, Canada
K1A 0N4

Bibliothèque nationale du Canada

Direction du catalogage
Division des thèses canadiennes

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE

THE UNIVERSITY OF ALBERTA

THE RELATIONSHIP OF REFERENTIAL AND LOGICAL TEXT CLUES AND THE RETENTION OF INFORMATION OF AVERAGE FOURTH GRADE READERS

by

© David C. Forster

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

FALL, 1978

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "The Relationship of Referential and Logical Text Clues and the Retention of Information of Average Fourth Grade Readers" submitted by David C. Forster in partial fulfilment of the requirements for the degree of Master of Education.

W. T. Fagan

(Supervisor)

Frances M. MacCannell

Peter Calder

Date Oct. 11, 1978

ABSTRACT

The ultimate goal of the act of reading is comprehension. Much research has been conducted that has attempted to analyze the graphic symbol system in order to identify factors which enable comprehension to take place. The Semantic Potential Theory of Language has been developed as a means for describing the information that language contains. The purpose of this study was to focus on that part of the theory dealing with text cues and to analyze the effects of differing amounts of text cues in connected discourse on the retrieval of information from the discourse.

Three passages from grade four basal readers were used as the instrument of the study. These passages were similar in style, content and length, but differed in terms of the referential and logical relations within them. One passage (A) represented the "typical" grade four passage in terms of the number of referential and logical relations while the other two passages were re-written so as to differ from the typical passage in textual information. Passage B contained approximately thirty-two percent more referential and logical relations than Passage A, while Passage C contained approximately thirty-two percent less referential and logical relations than Passage A.

Twenty average grade four readers were randomly selected from a population of eighty-nine grade four students to comprise the study sample. Each subject was asked to read each passage silently and after each reading was asked to orally tell what the passage was about. These recalls were tape-recorded and later transcribed into protocols for analysis. The total number of propositions and total number of referential and logical connectives recalled were recorded and subjected to statistical analysis.

Reading achievement scores from a locally developed reading test were also recorded for a correlation analysis.

The statistical analysis of the data involved a one-way anova with repeated measures across the three passages. These data were subjected to t-tests to assess whether or not there were significant differences in the number of propositions, the number of referential connectives in each of two categories and, the number of logical connectives in each of two categories recalled by the subjects across the three passages. When significant differences did occur the data were further analyzed by a Newman-Keuls Comparison Between Ordered Means to determine where the differences occurred. Pearson product moment correlations were tabulated to assess the relationship of reading achievement and each of the five variables in each passage.

The results of the study indicated that significant differences in the number of referential connectives category one, do occur when these connectives are increased in discourse, however this difference does not occur when these connectives are decreased in the passages. The results also indicated no significant differences among the other connectives studied (categories two, three and four) when they were manipulated. The correlation coefficients indicated a relationship between reading achievement and the use of logical connectives in Passages A and C.

The findings of the study indicate that differing the number of connectives do not greatly affect the amount of information recalled. A number of reasons are suggested as to why this occurred. Suggestions for instruction and for further research in this area are also included.

ACKNOWLEDGEMENTS

I am indebted to the following people who assisted and supported me during the course of this study.

Dr. William T. Fagan, my advisor, who was always available to provide guidance and support. For his insightful questions, his comments and encouragement, I am deeply grateful.

Dr. Frances MacCannell and Dr. Peter Calder, members of my examining committee. Their questions and suggestions were a welcome and beneficial input to this study.

My wife Sheila and my children who provided not only inspiration and encouragement during the course of this study but also unselfishly endured the many hours of an "absentee" husband and father with understanding and support.

My parents who have always encouraged and supported my endeavors.

Finally, I should like to acknowledge the assistance of Sonia Rywak and Irene Burak who typed the manuscript on such short notice.

TABLE OF CONTENTS

CHAPTER		PAGE
I	INTRODUCTION	1
	Introduction and Topic	1
	Purpose of the Study	2
	The Problem	2
	Definition of Terms	2
	Hypotheses	6
	Assumptions	7
	Limitations	7
	Significance of the Study	8
	Plan of the Investigation	8
II	RELATED LITERATURE	9
	Traditional View of Context Clues	9
	Semantic Potential Theory of Language	14
	Research Related to Components of the Semantic Potential Theory of Language	15
	Summary	16
III	THE DESIGN OF THE STUDY	17
	The Experimental Design	17
	The Theory Base for the Analysis of the Data	18
	Instruments	19
	Selection of the Sample	20
	Procedure	22
	Analysis of Data	23
	Statistical Analysis	24
	Summary	25

CHAPTER

PAGE

IV RESULTS..... 26

Hypothesis 1 (a)..... 26

Discussion..... 27

Hypothesis 1 (b)..... 29

Discussion..... 29

Hypothesis 1 (c)..... 32

Discussion..... 32

Hypothesis 1 (d)..... 34

Discussion..... 35

Hypothesis 1 (e)..... 36

Discussion..... 37

Hypothesis 2..... 38

Discussion..... 38

Summary..... 39

V CONCLUSIONS AND IMPLICATIONS..... 41

The Study in Review..... 41

Discussion of Findings..... 42

Implications for Teaching..... 49

Suggestions for Further Research..... 50

Conclusion..... 51

BIBLIOGRAPHY..... 52

APPENDIX A.

DEFINITIONS AND EXAMPLES OF REFERENTIAL AND LOGICAL CONNECTIVES..... 55

APPENDIX B.

SYNTACTIC FORMS OF PROPOSITIONS..... 59

PAGE

APPENDIX C.

INSTRUMENTS..... 65

APPENDIX D.

SUPERORDINATE/SUBORDINATE ANALYSIS OF INSTRUMENTS..... 72

LIST OF TABLES

TABLE		PAGE
III-1	PERCENTAGE DIFFERENCE IN EACH CATEGORY AND AVERAGE PERCENTAGE DIFFERENCE ACROSS ALL CATEGORIES BETWEEN TYPICAL AND ATYPICAL PASSAGES	20
III-2	INTERRATER RELIABILITY	24
IV-1	ANALYSIS OF VARIANCE FOR PROPOSITIONS RECALLED ACROSS PASSAGES	26
IV-2	MEAN NUMBER OF PROPOSITIONS RECALLED FOR EACH PASSAGE	27
IV-3	PEARSON PRODUCT MOMENT CORRELATIONS FOR THE NUMBER OF PROPOSITIONS AND NUMBER OF CATEGORY ONE, TWO, THREE, AND FOUR CONNECTIVES RECALLED IN PASSAGES, A, B, AND C	29
IV-4	ANALYSIS OF VARIANCE FOR CATEGORY ONE CUES RECALLED ACROSS PASSAGES	30
IV-5	MEAN NUMBER OF CATEGORY ONE CUES RECALLED FOR PASSAGES A, B, AND C	30
IV-6	SIGNIFICANT DIFFERENCES BETWEEN PASSAGES FOR CATEGORY ONE CONNECTIVES	31
IV-7	ANALYSIS OF VARIANCE FOR CATEGORY TWO CUES RECALLED ACROSS PASSAGES	33
IV-8	MEAN NUMBER OF CATEGORY TWO CUES RECALLED FOR PASSAGES A, B, AND C	33
IV-9	ANALYSIS OF VARIANCE FOR CATEGORY THREE CUES RECALLED ACROSS PASSAGES	34
IV-10	MEAN NUMBER OF CATEGORY THREE CUES RECALLED IN PASSAGES A, B, AND C	35

TABLE		PAGE
IV-11	ANALYSIS OF VARIANCE FOR CATEGORY FOUR CUES RECALLED ACROSS PASSAGES	36
IV-12	MEAN NUMBER OF CATEGORY FOUR CUES RECALLED IN PASSAGES A, B, AND C	37
IV-13	PEARSON PRODUCT MOMENT CORRELATIONS FOR READING ACHIEVEMENT AND NUMBER OF PROPOSITIONS AND CATEGORY ONE, TWO, THREE AND FOUR CONNECTIVES RECALLED IN EACH PASSAGE	38
V-1	MEANS FOR REFERENTIAL AND LOGICAL CONNECTIVES PER T-UNIT FOUND IN A SAMPLE OF GRADE FOUR BASAL READERS BY ADAMS	48

CHAPTER I

INTRODUCTION

Introduction and Topic

The goal of any system of language is to produce meaningful communication between the language-sender and the language-recipient. In the graphic language system the recipient is the reader, and his goal is comprehension: the construction of meaning from the graphic symbols that are present on the page. The reader then, in order to realize his goal of comprehension, must have at his disposal, strategies for acquiring meaning from the graphic symbols. Just what all of these strategies are and how they are utilized during the active reading process is an enigma that has given rise to many theories and models of the reading act.

Some researchers, Davis (1972), Holmes (1970) and Singer (1970) see comprehension as a hierarchy of sub-skills that develop in the reader. Others, most notably Goodman (1970) and F. Smith (1971) reject this hierarchical concept of sub-skills in favor of an eclectic approach to print where the reader varies his processing of the print almost continuously as he reads. Regardless of the approach, all researchers agree upon the goal - comprehension. Language, in itself does not contain meaning, but rather contains clues, syntactic and semantic, that enable the receptor to reconstruct meaning, based upon the application of his own knowledge of language and his knowledge of the world.

Fagan (1978) in a study entitled Oral Language of Children, Ages Nine, Ten and Eleven has developed the Semantic Potential Theory of Language as a theory to analyze the oral language of children. A suggestion put forth in that study as a guide to further research is:

> Perhaps the most challenging avenue to pursue is the reception half of the theory. The cues which the reader selects from a language utterance and the relationship of these cues to meaning should contribute greatly to the knowledge of language comprehension. (p. 188)

It is with this area of research that the present study is concerned, however the focus will be upon the cues selected from written language rather than oral language.

Purpose of the Study

As previously stated the graphic symbols upon the printed page contain cues which the reader uses as he samples the print for information. The Semantic Potential Theory of Language has been developed as a means for language analysis. The purpose of this study is to attempt to utilize the textual information part of the Semantic Potential Theory of Language as a tool for the analysis of information retrieval from connected discourse.

The Problem

The major problem addressed in this study is do differing amounts of textual information cues in connected discourse affect the information retrieved from that discourse. This study will be concerned with:

a) passages controlled for different numbers of language cues and,

b) an analysis of children's oral recall of written discourse in terms of the number of propositions and number and types of text cues which will be related to the number of propositions and number and types of text cues present in the original discourse.

Definition of Terms

The following terms will be used in this study and are defined below.

T-unit: consists of a main clause and any subordinate clauses attached to it. The T-unit will be used as the first step in dividing the oral recalls into propositions for analysis.

Proposition: refers to a unit of meaning comprised of a verbal unit plus one or more nouns, and may be specified by a syntactic form. (See Appendix B).

Text Relations: refers to linguistic information that establishes relationships across propositional units in connected discourse.

Referential Relations: refers to a type of text relation that signals a backward relationship (refers to an antecedent in a previous proposition) or a forward relationship (refers to a postcedent in a subsequent proposition) across propositions. The referential relation information system contains the referential connectives given below. For examples and definitions of each referential connective see Appendix A.

Referential Connectives

refers to

Antecedent	Postcedent
Pro-form	Pro-form
Pro-relative	Complementizer
Repetition	
Synonym	
Class Inclusion	
Derivation	
Inclusion	
Formal Repetition	

Logical Relations: Refers to a type of text relation that serves to distinguish time-order, location, and causality relationships across propositional units. The connectives included in the logical relations information system are shown below. For definitions and examples of each logical connective see Appendix A.

Logical Connectives

spatial

conditional

conjunction

temporal conjunction

temporal disjunction

contrast

comparison

Cue Categories: The referential and logical relations cues were each grouped into two separate categories in accordance with the findings of Fagan's (1978) study. The referential relations cues were grouped into two categories because of Fagan's (1978) finding that some cues (category two) differed significantly over the age levels in his study. The logical relations cues were also grouped because two of them, conjunction and temporal disjunction, have a similar function and were used more frequently, than the rest of the cues in this category. A diagram of the referential and logical relations cues, after categorization appears below.

Referential Relations Cue Categories

Category 1	Category 2
pronoun	class inclusion
relative pronoun	derivation

synonym
repetition
complementizer
inclusion
formal repetition

Logical Relations Cue Categories

Category 3
conjunction
temporal disjunction

Category 4
spatial
condition
disjunction
temporal conjunction
contrast
comparison

Type of Passage: refers to one of three passages, similar in content and style, that were presented to the subjects:

Passage A: This passage was called "Jennie". It contained one hundred propositions and referential and logical text cues roughly equivalent to the means found by Adams (in progress) in grade four basal readers. It is also referred to as the "typical" passage.

Passage B: This passage was called "Scotty". It contained one hundred propositions and roughly thirty-two percent more referential and logical text cues than those in "Jennie". It is also referred to as the "atypical more" passage.

Passage C: This passage was called "Percy". It contained one hundred propositions and roughly thirty-two percent less referential and logical text cues than those found in "Jennie". It is also referred to as the "atypical less" passage.

Average Reader: refers to those subjects whose total scores on the decoding sub-tests of the Edmonton Public Schools Reading Test (1977) fall on the 50th percentile or above and whose total scores on the comprehension sub-tests of the Edmonton Public Schools Reading Test (1977) fall between the 25th and 75th percentiles. The 50th percentile was arbitrarily chosen as the cut-off point for the decoding sub-tests in an effort to reduce decoding difficulties from the comprehension task.

Hypotheses

The following null hypotheses will be investigated.

1. There will be no significant differences between Passages A, B and C for:
   a) the number of propositions recalled
   b) the number of referential category #1 cues recalled
   c) the number of referential Category #2 cues recalled
   d) the number of logical Category #3 cues recalled
   e) the number of logical Category #4 cues recalled.
2. There will be no significant relationship between reading achievement scores and
   a) the number of propositions recalled
   b) the number of referential Category #1 cues recalled
   c) the number of referential Category #2 cues recalled
   d) the number of logical Category #3 cues recalled
   e) the number of logical Category #4 cues recalled

across each passage.

Assumptions

The study was carried out with the following underlying assumptions.

That the Semantic Potential Theory of Language developed by Fagan (1978) which was found valid and reliable for his population will also be valid and reliable for the population of this study.

That the reading achievement scores obtained on the Edmonton Public Schools Reading Test administered in May 1977 will be a valid and reliable measure of the subjects' reading ability in April 1978.

Limitations

The following limitations are noted.

The experimental population was assigned by the Edmonton Public School Board, and was limited to eighty-nine grade four students from "normal" classrooms. The application of selection criteria as outlined in Chapter III reduced this population to twenty-eight subjects. The sample of twenty subjects, balanced for sex was then randomly selected from this population. The findings are applicable to this group.

Although steps were taken to reduce the effects of the experimental situation, the presence of the tape recording equipment and the one-to-one situation with the researcher may have created a somewhat atypical situation from a regular classroom environment.

Other variables which may have had an effect on the results, such as verbal fluency, experiential background and previous instruction were not controlled for in the study.

The cues analyzed in this study are a small number of the total language cues that are inherent in written language. They have been overtly marked for analysis. Possible effects of other language cues has not been assessed.

The reading test scores used in the study were derived from group tests, and may not reflect the same accuracy as individual tests. The reliability of the test was however quite high (KR-20 = 0.834 for decoding, and 0.911 for comprehension) and the percentile scores were based on local norms.

Significance of the Study

According to the Semantic Potential Theory of Language, language provides readers with information which has the potential to become meaningful. One type of information is termed text relations and concerns itself with the information which marks relationships across propositions or meaning units in connected discourse. The results of this study should provide information on how these text relations cues are utilized as an aid to comprehension by the reader. It may provide some information about how written discourse can be made more comprehensible for the reader. This study will mark a beginning point in the reception half of the Semantic Potential Theory of Language and should provide some information on the viability of this theory as well as direction for further research in this area.

Plan of the Investigation

In Chapter II, the writer will present a review of the literature relevant to this study. Chapter III will contain the design of the study. The findings will be presented and discussed in Chapter IV. Chapter V will present an overview of the study, further discussion of the findings, implications of the findings and suggestions for further research.

CHAPTER II

RELATED LITERATURE

In this chapter the writer will discuss the traditional investigations of context clues, the Semantic Potential Theory of Language, and research findings that are related to components of the Semantic Potential Theory.

Traditional View of Context Clues

The term "context" has had wide-ranging connotations. It has been used to describe the total communicative situation including all social and psychological factors that enter into the situation and also in a more limited way to describe the manner in which readers obtain word meaning. Although research has been done over this wide range of "context", traditionally most empirical research seems to be oriented toward the "word-meaning" connotation of the term. This type of research has focussed upon "context clues", those clues within the text that aid the reader in identifying the meaning of an unknown word in the text. The goal then was to aid the reader in discerning the meaning of an individual word from the clues incorporated in the surrounding text. Traditional research studies reflect this point of view of context clues, and has often concerned itself with the identification, classification, and usage of context clues for this purpose.

One of the earliest works in this century that makes reference to the importance of relationships among words as a clue to meaning was a study by E. L. Thorndike (1917). Thorndike presented his subjects with a number of paragraphs to read. After reading the paragraphs they were to answer questions on the content of the paragraphs, referring back to the

paragraph as required. He found that his subjects made many errors and felt that it was due to a lack of ability to see relationships among words and sentences. Thorndike called for a need for research in the area of context when he wrote:

> ...little attention has been paid to the dynamics whereby a series of words whose meanings are known singly produces knowledge of meaning of a sentence or paragraph. (p. 324)

He went on to shed some light on this phenomena by likening paragraph understanding to problem solving in mathematics:

> "Understanding a paragraph is like a problem in mathematics. It consists in selecting the right elements of the situation and putting them together in the right relations, and also with the right amount of weight or influence or force for each." (p. 329)

Artley (1943) defined ten major clues and twenty-one sub-categories of clues in written discourse. McCullough (1943) defined seven categories of context clues, and Betts (1946) defined eleven such categories. More recently, Ames (1965) identified fourteen types of context clues contained within written discourse. Dulin (1968), in examining the work of the four researchers mentioned above, identified five categories of context clues that were common to all four classification schemes.

Cloze research into reader utilization of context clues as an aid to word understanding has tended to follow a regular pattern. Rankin and Overholser (1969) used a Context Test to determine the ability of grades four, five and six subjects to use Ames' classification of context clues to acquire word meaning. This Context Test consisted of a number of items which were presented to each subject. Each item contained an embedded context clue and a blank space. The subject was required to read the item, and by using the embedded clue, provide the missing word,

or an acceptable synonym. They found that there were differences in difficulty among the thirteen context clues studied, the percentage of accuracy ranging from twenty-six to sixty-nine percent. They also found that the rank order of difficulty among the thirteen clues was highly consistent among grade levels and reading levels within grades and that the average range of accuracy increased over the grades. They concluded that reading ability is predictive of the ability to use each of the thirteen context clues, since the differences among grade levels in their ability to utilize context clues could be accounted for almost entirely by differences in reading ability.

A similar study was conducted by Laing (1974) using subjects in grades four, six and eight. She embedded Dulin's five categories of context clues in sentences and paragraphs to determine the ability of fifty-four subjects to process these embedded clues in order to acquire word meaning. The task of the subject was to use the embedded clue to supply a meaning for: (a) a familiar word which was represented by a blank space or a nonsense word, and (b) an unfamiliar word that was underlined in the text. One of her findings was that the very proficient and proficient readers were able to make better use of all five types of contextual clues to unlock the meaning of unfamiliar words than could the less proficient readers.

In an effort to determine whether or not it is profitable to teach the use of a classification scheme of context clues to children Askov and Hamm (1976) administered a pretest to 133 subjects in grades three, four and five. The pretest assessed the subjects' ability to use cause and effect, direct description and contrast, as contextual aids to unlock word meaning. The pretest incorporated a cloze technique, with four multiple choice answers supplied. After administration of the pretest the subjects

were divided into experimental and control groups. The experimental group received approximately four hours instruction in the use of these three contextual aids while the control group received no instruction. Both a posttest administered after a two-week period and the re-administration of a pretest after a six-week period indicated that the subjects who received instruction were able to use the three context clues to unlock word meaning significantly better than the control group.

The pattern that becomes apparent from the design of these studies is threefold: (a) the use of context clues as aids to the acquisition of word meaning, (b) the use of embedded clues in test items, and (c) the use of sentences and/or short paragraphs as test items. The research seems to clearly indicate that context clues can be a powerful aid to gaining word meaning, and it appears that the use of clues embedded in sentences and paragraphs is a viable method of obtaining data. The ability to use these context clues can undoubtably aid the reader in acquiring word meaning. The acquisition of word meanings however is not the only component of the comprehension task.

Isakson and Miller (1976) conducted research that was somewhat different than those above in that rather than assessing the subject's use of context clues to ascertain word meaning, they assessed good and poor reader's sensitivity to syntactic and semantic cues within the context of a sentence. Each of the forty-eight grade four subjects were asked to read orally one sentence from each of twelve sentence trios. The main verb was manipulated to create three types of sentences within each trio. Type A sentences were syntactically and semantically acceptable, Type B sentences were syntactically acceptable but semantically unacceptable, and Type C sentences were syntactically and semantically

unacceptable. Each subject read four sentences of each type. Isakson and Miller hypothesized that good comprehenders would show an increase in oral reading errors from type A to B to C and poor comprehenders would not. They found that good comprehenders made fewer errors on sentence types A and B, however their errors increased significantly on type C sentences. Poor comprehenders on the other hand made the same number of errors on all three sentence types. They concluded that good comprehenders, in their quest for meaning are sensitive to language constraints within the context of a sentence. Poor comprehenders on the other hand view reading as a word recognition task. They are not affected by the presence of syntactic or semantic violations in sentences they read and therefore they do not utilize the language structure and the syntactic and semantic cues within the sentence context to integrate individual word meaning into sentence meaning.

Researchers of context have realized the importance of relationships of words within a sentence as a clue to word meaning. Similarly, research has demonstrated that sentence meaning is also dependent upon the relationships of sentence constituents. Just as the meaning of a sentence is not the sum of its individual word meanings, but rather is dependent upon the relationship of words to one another within the sentence unit, so also is the meaning of extended discourse dependent in part on the relationship of its constituent parts, both words and sentences. To study the effects of surrounding context on the comprehension of extended discourse a view of context which differs from the "word meaning acquisition" view is required.

Semantic Potential Theory of Language

The Semantic Potential Theory of Language (Fagan, 1978) seems to provide this different view of context as it relates to the understanding of connected discourse by the reader.

Language is seen as containing various kinds of information which provide input for the listener/reader who then constructs meaning on the basis of the language cues utilized. Meaning, which is triggered by linguistic factors is viewed as a psychological construct. One type of linquistic information that is conveyed in a language utterance is termed Text Relations. The term "text" is chosen rather than "context" because the latter term suffers from wide-ranging views from the narrow sense, as has been shown above, i.e. word meaning clues, to an all encompassing sense incorporating the total communicative situation which includes the life-experience of the sender and receiver. The word text refers to continuous language output that extends beyond the single utterance, i.e. connected discourse. The basic unit of meaning is the proposition and may be cued by the propositional form (See Appendix B). Text relations refer specifically to relations across propositional units. The concern therefore is the relationships that are triggered between propositional units in connected discourse rather than the relations between items within propositions. Total paragraph comprehension is the goal. Text Relations may be sub-divided into two types of relations, referential and logical (see Chapter I).

Just as the meaning of a sentence is not simply the sum total of its constituent word meanings but rather is affected by the relationships inherent among those words, so also the meaning potential of connected discourse is dependent upon the perception of relationships inherent across

the units of meaning contained within the passage. The Semantic Potential Theory of Language with its delineation of Text Relations appears to provide a viable theory whereby the study of these relationships can be undertaken. This theory is newly developed (1978) and as a result, other than the study in which the theory was developed there is no published research that has utilized this theoretical base for research purposes. There has been, however, some research which, though not based on the theory directly, does have implications for some components of the theory.

Research Related to Components of the Semantic Potential Theory of Language

Robertson (1966) studied the relationship between a knowledge of connectives and reading achievement. Connectives studied included subordinate clause connectives (although, because, if, so, that, when, where), relative pronouns (that, which, who), co-ordinate clause connectives (and, but, for, yet), connectives which link sentences (however, thus), and a special case of "absent" connectives. Many of these are identical to those connectives contained within logical relations in the Semantic Potential Theory of Language. She found a significant relationship between the understanding of connectives and reading ability, and a developmental increase in understanding of the seventeen connectives over grades four, five and six. In addition, she found significant differences in the rate of development of understanding of different connectives and a significant variation of understanding of connectives within grades.

A study of pronominal reference (a set of cues within the referential component of the Semantic Potential Theory of Language) was conducted by Miller (1976). He investigated the ability of high and low grade two

readers to comprehend the antecedent/anaphora relationship by examining (a) the number of antecedents interacting in a discourse, (b) the distance between antecedent and anaphora, and (c) the anaphoric category. He found the high readers significantly better at comprehension of the antecedent/anaphoric relationship regardless of the variable tested. He also found that the nominative category (pronouns functioning as sentence subjects) was the least difficult to comprehend, the objective category (pronouns functioning as direct and indirect objects, or objects of prepositions), the next to least difficult to comprehend, and the genitive category (pronouns that indicate possession), the most difficult to comprehend.

Summary

Many investigations into the nature of the reading process over the years have demonstrated the importance of context, both in its broadest and narrowest senses, to the acquisition of meaning. Most investigations in recent years seem to be concerned with word meaning in unrelated sentences or short paragraphs. There has been little empirical research into the nature of context in terms of the establishment of meaning across propositional or idea units in connected discourse. The Semantic Potential Theory of Language (Fagan, 1978) appears to offer a theory whereby the use of referential and logical relations cues in text can be analyzed in order to assess their effect upon the acquisition of meaning. One method of assessing the effect of these cues is investigated here. The design of the study will be presented in the next chapter.

CHAPTER III

THE DESIGN OF THE STUDY

In this chapter the writer will discuss the experimental design of the study, the theory base for the analysis of the data, instruments, sample selection, procedure, analysis of data, and statistical analysis.

The Experimental Design

The design of the study was based upon a one-way analysis of variance with repeated measures. Since the purpose of this study was to assess the effects of differing amounts of categorized informational input on text retrieval (as demonstrated by oral recalls) three passages were administered to each subject. These passages were similar in content and narrative style and were controlled for number of propositions (a unit of meaning consisting of a verbal unit plus one or more nouns). The three passages were controlled in order to reflect differences in two classes of referential connectives (categories one and two) and also in two classes of logical connectives (categories three and four). These controlled passages thus represented the independent variables. The following diagram is a summary of the experimental design:

Passage A	P	1	2	3	4
Passage B	P	1	2	3	4
Passage C	P	1	2	3	4

P = propositions

1 = category 1
2 = category 2 } referential information

3 = category 3
4 = category 4 } logical information

I.Q. and S.E.S. were not considered as important factors (Fagan, 1978) and therefore were not included as variables in the design. A reading comprehension score was recorded and was analyzed for correlation with the five variables across all three passages.

The Theory Base for the Analysis of the Data

The basic theory underlying the analysis of the data is the Semantic Potential Theory of Language (Fagan, 1978). This theory considers language as containing various kinds of information cues that may be used by the reader to construct meaning. One type of information is Text Information which includes words that signal relations between propositions, or units of meaning. Text information can be sub-divided into two classes, referential relations and logical relations. Referential relations are indicative of either a backward relation (refers to an antecedent) or a forward relation (refers to a postcedent). Antecedents may be signalled by such referential connectives as pronoun, relative pronoun, repetition, synonym, class inclusion, derivation, inclusion or formal repetition, while postcedents may be signalled by pronouns or complementizers. Logical relations between propositions may be signalled by such logical connectives as spatial, conditional, conjunction, temporal conjunction, disjunction, temporal disjunction, contrast or comparison. For definitions and examples of the above referential and logical connectives, see Appendix A. The referential and logical connectives were divided into categories for the purposes of this study (Chapter II). These classes of Text Information were used as a basis for the selection of instruments and the analysis of the data in this study.

Instruments

The passages that were selected for this study were previously analyzed by Adams (in progress) for text information in accordance with the Semantic Potential Theory of Language (Fagan, 1978). Adams analyzed the text information in six stories in each of six different grade four reading series presently approved for use in the Province of Alberta. Adams' means for each category of referential and logical relations were utilized to identify passages that were closest to the mean across all categories of relations and thus a "typical" grade four passage was selected. Once this passage was identified it was necessary to find two other passages that were similar in content and narrative style that could be utilized in the study, as "atypical" passages. The length was adjusted so that there were one hundred propositions in each passage. It was decided to use passages from the Nelson Language Development Program for two reasons:

a) This program was only recently authorized for use in Alberta and therefore was not likely being widely used by the population, and

b) two other passages from this series were similar in content and narrative style and it appeared as though these two could be adjusted without too much difficulty to be the "atypical" passages.

The two passages other than the "typical" were rewritten in accordance with the following criteria:

a) Each passage included one hundred propositions.

b) One passage was re-written so that it would contain approximately thirty-two percent less information in each category (one, two, three, and four) than the "typical" passage. This passage then became

known as the "atypical less" passage.

c) One passage was re-written so that it would contain approximately thirty-two percent more information in each category than the "typical" passage. This passage became known as the "atypical more" passage. Jennie was the "typical" passage while Percy was the "atypical less" passage and Scotty, the "atypical more" passage. (See Appendix C). The following table shows the information per category in all three passages, the percentage difference in each category between the typical and atypical passages and the average percentage difference across all categories between the typical and atypical passages.

TABLE III - 1

PERCENTAGE DIFFERENCE IN EACH CATEGORY AND AVERAGE PERCENTAGE DIFFERENCE ACROSS ALL CATEGORIES BETWEEN TYPICAL AND ATYPICAL PASSAGES

PASSAGES	CAT. 1	CAT. 2	CAT. 3	CAT. 4	Average Diff.
TYPICAL-ATYPICAL LESS	25.6	28.5	35.3	36.3	31.4
TYPICAL-ATYPICAL MORE	33.7	28.5	35.3	36.3	33.4

The final step was to randomize the order of the selected instruments in order to eliminate effects due to practice.

Selection of the Sample

The sample for this study was selected from three schools within the Edmonton Public School System. The number of grade four students available within these schools was eighty-nine. Although sex was not considered as a factor, the researcher felt that the sample of twenty should be balanced and consequently chose ten male and ten female subjects. Six factors were considered in selecting a sample from this population of

eighty-nine:

a) Repeaters: Four subjects were dropped from the population because they were repeating grade four.

b) Pilot Study: Three subjects were dropped from the population because they were exposed to the instruments during a pilot study.

c) Results of Edmonton Public Schools Elementary Reading Test: This test was constructed of materials available from: The Edmonton Public School District #7, Two Publishing Companies (Houghton Mifflin Company and Thomas Nelson and Sons (Canada) Ltd.), and The Ontario Institute for Studies in Education. The test contains sixty-three questions to assess student's decoding skills and seventy-seven questions designed to assess comprehension skills. It was administered to all grade three students in Edmonton Public Schools in May of 1977. The results were tested for reliability at that time using the KR-20 formula. The reliability for the decoding section of the test was 0.834 and for the comprehension section 0.911. Content validity was attained by having committees of teachers analyze the test items. For the purposes of this study it was assumed that those students whose scores on both sections were "average" in May, 1977 were likely to be "average" in these skills in April of 1978. The criteria for the sample selection then became a score of fifty percentile or greater on the decoding section of the test and a score of between the twenty-fifth percentile and seventy-fifth percentile, i.e., within one standard deviation of the mean, on the comprehension test. Since the nature of the task of this study was basically a comprehension task the researcher felt that setting the cut-off point on the decoding section at the fiftieth percentile would eliminate those subjects who

may experience word identification problems. On the basis of this criteria a further fifty subjects were eliminated from the population.

d) No results on the Edmonton Public Schools Reading Test: A further three subjects were dropped from the population because they had not written the Edmonton Public Schools Reading Test due to absence or they did not attend Edmonton Public Schools in 1977.

e) English as a Second Language: One subject was dropped from the sample because English was not his mother tongue and although he met all other criteria set forth for sample selection he was experiencing difficulty with oral expression.

f) Nelson Language Reading Program: As the instruments were derived from this Reading Program it was imperative that no subjects had used these materials in their instructional program. As none of the subjects in the population had used the program, no one was eliminated under this criteria.

The application of the above criteria to the grade four pupils at the three schools reduced the population for the study to twenty-eight subjects, fifteen male and thirteen female. This population was then listed in two groups, male and female, and subjects were randomly eliminated from each group leaving a sample of twenty subjects, ten male and ten female.

Procedure

The researcher first met the sample subjects as a group at each school to explain what the study was about and to specify that it was not a test situation and would not therefore be considered as an evaluative tool. Each subject was then taken one at a time into a room with tape recording equipment set up. The subjects were informed that they would be recorded, however the recorder and microphone were hidden from view so as not to

distract them in any way. The instructions to the subject were as follows:

> "I have three short stories here and I am going to ask you to read each one silently to yourself. After you finish reading each story I am going to ask you to tell me what the story is about."

The subject was then presented with the stories, in random order and after reading each story was asked what it was about. When it appeared that the subject was finished with the recall he/she was asked if there was anything else. The recalls were recorded and later transcribed for analysis.

Analysis of Data

The transcribed recalls were analyzed in the following manner:

T-units: The unaided recalls were divided into T-units (main clauses with any subordinate clauses that may be related to it).

Mazes: All series of words, parts of words, repetitions or unattached sound fragments that did not constitute a T-unit were identified and deleted from the recall. Four types of mazes (Loban, 1976) were identified and deleted:

a) Noise: the audible pause (er, uh, um)

b) repeat: the repetition of phrases, words or parts of words

c) edit: word tangles resulting from a correction of content or syntactic structure, or a change of direction

d) holder: Marking time before continuing (Well ...)

Mazes were then discarded and the T-units were then analyzed into propositions which were counted and recorded for each passage recall by each subject.

The protocols were then analyzed for the number of propositions, number of referential connectives (categories one and two) and number of Logical connectives (categories three and four).

Reliability:

In order to assure the reliability of the above analysis by the researcher an independent judge also analyzed the recalls of five subjects. The number of propositions as well as the number of referential and logical connectives in each category (one, two, three and four) were analyzed by this judge. Interrater agreement was calculated by using the Arrington Formula as outlined by Feifel and Lorge (1950) where the number of scores agreed upon by each observer is doubled and then is divided by this total plus the disagreements.

i.e. $$\frac{2 \times \text{Agreements}}{(2 \times \text{Agreements}) + \text{Disagreements}}$$

This calculation is then expressed as a percent. The percentage agreement between the researcher and the independent judge for the number of propositions and number of connectives in each category is given in the following table.

TABLE III - 2

INTERRATER RELIABILITY

	Propositions	Cat. 1	Cat. 2	Cat. 3	Cat. 4
Percent Agreement	98%	95%	90%	97%	97%

Statistical Analysis

The statistical treatment of the data involved a one-way analysis of variance with repeated measures across all three passages. The number of propositions and number of referential and logical connectives in each

category were compared across all three passages for each subject. At Newman-Keuls comparison between ordered means was also utilized to indicate where significant differences occurred across passages.

The degree of relationship between the reading comprehension score and each of the five variables across the three passages was assessed through Pearson product moment correlations.

The results on both the analysis of variance and the correlations were accepted as significant when the probability reached $p < .05$.

Summary

This chapter has discussed the experimental design of the study, the theoretical base for the analysis of the data, the instruments, sample selection, experimental procedure, analysis of the data, and an outline of the statistical analysis has been included.

CHAPTER IV

RESULTS

This chapter contains the results of the study and is organized in the following manner: each hypothesis is re-stated from Chapter I and a statement of rejection or non-rejection is given, followed by table containing the data on the basis of which the hypothesis was or was not rejected, and finally a discussion of the results. Further tables are included in the discussion as required. The chapter is concluded with a summary.

Hypothesis 1a

There will be no significant differences between Passages A, B and C for the number of propositions recalled.

This hypothesis was not rejected. (Table IV - 1)

TABLE IV - 1

ANALYSIS OF VARIANCE FOR PROPOSITIONS RECALLED ACROSS PASSAGES

SOURCE OF VARIATION	SS	DF	MS	F-RATIO
BETWEEN PEOPLE	2179.40	19	114.71	
WITHIN PEOPLE	1674.00	40	41.85	
TREATMENTS	72.40	2	36.20	0.86*
RESIDUAL	1601.60	38	42.15	
TOTAL	3853.40	59		

*probability of F = 0.4317 (not significant)

Discussion

The number of propositions recalled by each subject was analyzed by a one-way analysis of variance with repeated measures for each of the three passages. The results of the analysis did not reveal significant differences in the number of propositions recalled across the three passages although the mean number of propositions recalled for each passage varied as shown in Table IV - 2 below:

TABLE IV - 2

MEAN NUMBER OF PROPOSITIONS RECALLED FOR EACH PASSAGE

PASSAGE	MEAN
A (typical)	17.80
B (atypical more)	18.50
C (atypical less)	20.40

The passages were presented in random order and therefore the hierarchical nature of the above means should not be due to practice effects. The fact however that there is no significant difference in the number of propositions recalled across the three passages seems to indicate that for the average grade four readers in this study the different numbers of referential and logical connectives within the three passages was not a significant influence in their memory for text reconstruction.

One possible explanation for this finding comes from Clark and Clark (1977). In reviewing the literature on memory, they point out that the proposition is the basic unit used by readers to reconstruct meaning. If

this is the case, then perhaps the number of propositions within the passages (in this case there were one hundred in each), rather than between-proposition connectives, is the overriding factor in determining passage recall from semantic memory. Research by Kintsch and Keenan (1973) showed that the greater the number of propositions the more reading time was required by their subjects.

Another possibility is that "absent" connectives such as those defined by Robertson (1966, p. 66) which were not explicitly stated in the text could have reduced the influence of the overtly stated connectives by providing a balance within categories and therefore had the effect of helping to equalize the number of propositions recalled. For example, in Passage C (atypical less) the following sentence appears:

> "Percy let out such a loud squawk Mrs.
> Gray gave in and turned on the set."

The referential connective "that" is not explicitly stated in this sentence, however the reader in applying his own linguistic knowledge to the page may perceive the relationship between the clauses of the sentence and in fact may in his propositional reconstruction process reconstruct the proper referential connection such that he would recall the sentence as:

> "Percy let out such a loud squawk that Mrs.
> Gray gave in and turned on the set."

This in fact would add another connective to the category one group.

Pearson product moment correlations show a high degree of significance between the number of propositions recalled and the number of category one, two, three, and four connectives recalled for Passages A (typical) and B (atypical more). For Passage C (atypical less) these correlations are significant only for categories one and three although category two

approached significance ($p. < .06$) (Table IV - 3). This suggests that there was a consistency between the recall of propositions and the recall of the connectives that join them.

TABLE IV - 3

PEASON PRODUCT MOMENT CORRELATIONS FOR THE NUMBER OF PROPOSITIONS AND NUMBER OF CATEGORY ONE, TWO, THREE AND FOUR CONNECTIVES RECALLED IN PASSAGES A, B AND C

PASSAGE	CAT. 1	CAT. 2	CAT. 3	CAT. 4
A	0.869**	0.461*	0.826**	0.830**
B	0.917**	0.648**	0.834**	0.603**
C	0.910**	0.419	0.840**	0.349

* $p. < .05$

** $p. < .01$

Hypothesis 1b

There will be no significant differences between Passages A, B and C for the number of referential category number one cues recalled.

This hypothesis was rejected. (Table IV - 4)

Discussion

The number of category one cues recalled by each subject was analyzed by a one-way analysis of variance with repeated measures for each of the three passages. The results of the analysis indicated significant differences across the three passages. The mean number of category one cues recalled for each passage is shown in Table IV - 5 below:

TABLE IV - 4

ANALYSIS OF VARIANCE FOR CATEGORY ONE CUES
RECALLED ACROSS PASSAGES

SOURCE OF VARIATION	SS	DF	MS	F-RATIO
BETWEEN PEOPLE	1762.85	19	92.78	
WITHIN PEOPLE	2173.34	40	54.33	7.05*
TREATMENTS	588.43	2	294.23	
RESIDUAL	1584.90	38	41.71	
TOTAL	3936.18	59		

* probability of F = 0.002 (significant)

TABLE IV - 5

MEAN NUMBER OF CATEGORY ONE CUES RECALLED FOR PASSAGES A, B AND C

PASSAGE	MEAN
A (typical)	16.40
B (atypical more)	23.95
C (atypical less)	19.00

In an effort to determine where these differences occurred the data were further analyzed by a Newman-Keuls Comparison Between Ordered Means. The differences between passages are shown in Table IV - 6 below:

TABLE IV - 6

SIGNIFICANT DIFFERENCES BETWEEN PASSAGES FOR CATEGORY ONE CONNECTIVES

PASSAGE A - B	PASSAGE A - C	PASSAGE B - C
.01	N.S.	.05

This analysis revealed a significant difference ($p < .01$) for category one cues recalled between Passage A (typical) and Passage B (atypical more) and a significant difference ($p < .05$) for category one cues recalled between Passage C (atypical less) and Passage B (atypical more). There was however no significant difference for category one cues recalled between Passages A (typical) and Passage C (atypical less).

Category one cues included such referential connectives as pronouns, relative pronouns, complimentizers, synonyms, and repetition. The results of the analyses indicates that the recalls of average grade four readers reflects the presence of category one connectives when such connectives are present in greater numbers than the typical passage. This relationship however does not appear to occur in the opposite direction, i.e. when the category one connectives are present to a lesser degree than in typical discourse. It may seem strange that such a relationship should occur in one direction and yet not in the opposite direction, however a possible explanation may be found if one looks at the relationship of written and oral language development.

Miller (1976) in his study of grade two subjects found that those subjects who best understood the antecedent/anaphora relationship in written language produced a smaller percentage of anaphora (in his pronominal

anaphoric categories) in oral language. He postulated that the use of pronouns and anaphora could be linked to language maturity. Fagan (1978) found no significant difference among subjects aged nine, ten and eleven in their oral language production of category one connectives. Perhaps the language maturity that Miller postulated has been achieved by age nine. If this were the case, then it might follow that the antecedent/postcedent relationship in oral language is well-understood by age nine. When recalling information that has been presented visually the reader is dependent not only upon his oral language capabilities, but also upon the various information that is conveyed in written language. The presence of varying numbers of category one connectives plus other linquistic information appears to reflect the level of maturity of the subjects in responding to written language. Thus, when a considerable number of referential connectives (of the category one type) are present, they are noted by the readers and used in their recalls.

Hypothesis 1c

There will be no significant differences between Passages A, B and C for the number of referential category number two cues recalled.

This hypothesis was not rejected. (Table IV - 7)

Discussion

The number of category two cues recalled by each subject was analyzed by a one-way analysis of variance with repeated measures for each of the three passages. The results of this analysis revealed no significant differences among the category two cues recalled over the three passages. There is however a difference in the mean number of category two cues recalled as shown in Table IV - 8.

TABLE IV - 7

ANALYSIS OF VARIANCE FOR CATEGORY TWO CLUES
RECALLED ACROSS PASSAGES

SOURCE OF VARIATION	SS	DF	MS	F-RATIO
BETWEEN PEOPLE	41.33	19	2.18	
WITHIN PEOPLE	50.00	40	1.25	
TREATMENTS	3.03	2	1.52	1.23*
RESIDUAL	46.97	38	1.23	
TOTAL	91.33	59		

* probability of F = 0.31 (not significant)

TABLE IV - 8

MEAN NUMBER OF CATEGORY TWO CUES RECALLED FOR PASSAGES A, B AND C

PASSAGE	MEAN
A (typical)	1.05
B (atypical more)	1.60
C (atypical less)	1.35

Category two included such connectives as class inclusion, derivation, inclusion, and formal repetition, all of which refer to an antecedent in the text. It appears as though the varying of the number of these cues in written discourse has little effect on their use in oral recall. Fagan (1978) found a significant difference in the use of class inclusion, derivation and formal repetition in the oral language output of subjects

aged nine, ten and eleven. These findings suggested the greatest difference between subjects aged nine and ten, with the ten year olds producing more of these types of connectives. It seems possible that the oral language development of the subjects in the present study may not have reached the stage where category two connectives are commonly used. If this were the case then the presence of category two connectives in written discourse may not elicit a category two retrieval from semantic memory. Indeed a cursory glance at commercial materials indicates that category two connectives are seldom taught in a formal manner. Thus it is possible that the subjects were unfamiliar with their function in written language and consequently ignored them in their recalls.

Hypothesis 1d

There will be no significant differences between Passages A, B and C for the number of logical category three cues recalled.

This hypothesis was not rejected. (Table IV - 9)

TABLE IV - 9

ANALYSIS OF VARIANCE FOR CATEGORY THREE CUES RECALLED ACROSS PASSAGES

SOURCE OF VARIATION	SS	DF	MS	F-RATIO
BETWEEN PEOPLE	299.93	19	15.79	
WITHIN PEOPLE	338.00	40	8.45	
TREATMENTS	7.23	2	3.62	0.42*
RESIDUAL	330.77	38	8.70	
TOTAL	637.93	59		

* probability of F = 0.66 (not significant)

Discussion

The number of category three clues recalled by the subjects was analyzed by a one-way analysis of variance with repeated measures for each of the three passages. The results of this analysis revealed no significant differences among the three passages for the number of category three cues recalled. Once again there was some variation in the mean number of category three cues recalled as shown in Table IV - 10.

TABLE IV - 10

MEAN NUMBER OF CATEGORY THREE CUES RECALLED IN PASSAGES A, B AND C

PASSAGE	MEAN
A (typical)	7.55
B (atypical more)	8.20
C (atypical less)	8.35

Category three connectives included conjunction and temporal disjunction. The manipulation of these connectives in the three passages had no significant effect upon the use of these connectives in the recalls. These connectives are basically used for conjoining equivalent propositions or demonstrating a sequential relationship between propositions.

Robertson (1966) found that the conjunctions "and" and "but" posed difficulty for subjects in grades four, five and six on the Written Connectives Test. It seems possible that the subjects of this study (grade four) do not have enough facility with these connectives to the point that varying the numbers of these connectives will affect their recalls. Another factor may be the multi-function of the connective "and then". It

seems to this writer that the connective "and then" can be used to signify a sequential relationship or simply to mean "this is what I remember next" rather than explicitly "this is what happened next". If this were the case, then the indiscriminate use of the "and then" connective in oral recalls could interfere with the understanding of the manipulated connectives and may be reflected by non-significant differences in the analysis of the number of connectives recalled.

Hypothesis 1e

There will be no significant differences between Passages A, B and C for the number of logical category number four cues recalled.

This hypothesis was not rejected. (Table IV - 11)

TABLE IV - 11

ANALYSIS OF VARIANCE FOR CATEGORY FOUR CUES RECALLED ACROSS PASSAGES

SOURCE OF VARIATION	SS	DF	MS	F-RATIO
BETWEEN PEOPLE	86.60	19	4.56	
WITHIN PEOPLE	85.33	40	2.13	
TREATMENTS	3.43	2	1.72	0.80*
RESIDUAL	81.90	38	2.16	
TOTAL	171.93	59		

* probability of F = 0.46 (not significant)

Discussion

The number of category four cues recalled by each subject was analyzed by a one-way analysis of variance with repeated measures for each of the three passages. The results revealed no significant differences for the number of category four cues recalled across the three passages. The mean number of category four cues recalled per passage is shown in Table IV - 12.

TABLE IV - 12

MEAN NUMBER OF CATEGORY FOUR CUES RECALLED IN PASSAGES A, B AND C

PASSAGE	MEAN
A (typical)	2.25
B (atypical more)	2.15
C (atypical less)	1.70

Category four cues included such connectives as conditional, disjunction, temporal conjunction, contrast, comparison, and spatial. Fagan (1978) found little usage of any of these logical connectives with the exception of the conditional among subjects aged nine, ten and eleven. They also appear to be infrequently used in written language. The number of connectives in this category in each of Passages A, B and C were seven, eleven, and fifteen respectively. Perhaps the infrequent use in both oral and written language combined with the little emphasis they receive in formal teaching may explain their lack of significance in influencing oral recalls.

Hypothesis 2

There will be no significant relationship between reading achievement scores and,

a) the number of propositions recalled,

b) the number of category one cues recalled,

c) the number of category two cues recalled,

d) the number of category three cues recalled, and

e) the number of category four cues recalled for each of the three passages.

Hypothesis two (d) was rejected for Passage A (typical) and two (e) was rejected for Passage C (atypical less). Except for these two cases, this hypothesis was not rejected. (Table IV - 13).

TABLE IV - 13

PEARSON PRODUCT MOMENT CORRELATIONS FOR READING ACHIEVEMENT AND NUMBER OF PROPOSITIONS AND CATEGORY ONE, TWO, THREE AND FOUR CONNECTIVES RECALLED IN EACH PASSAGE

PASSAGE	PROPOSITIONS	CAT. 1	CAT. 2	CAT. 3	CAT. 4
A	0.345	0.301	0.132	0.482*	0.320
B	-0.285	-0.346	-0.069	-0.104	-0.232
C	0.152	0.067	0.080	0.064	0.763**

* $p. < .05$

** $p. < .01$

Discussion

The significant relationship between reading achievement scores and text cues occurs only for logical connectives, (categories three and four),

and only in Passages A and C, the typical and atypical less passages respectively. Since a significant relationship does not exist when many of these connectives are present, i.e. in Passage B, it appears that high reading achievers may be more effective in understanding and utilizing these logical connectives when there are few present in text material. Oral language maturity may also affect the usage of these connectives in recall, for as noted by Fagan (1978), little use was made of these connectives by children aged nine, ten and eleven, in an oral language task. In addition it should be noted that there was not a great deal of variation in the reading achievement scores of the subjects in this study which would thus affect the strength of the correlations.

Summary

Five null hypotheses were tested in this study. The focus of these hypotheses was whether varying the amounts of linguistic information contained in connected discourse would make a difference in the recalls of that discourse. Of the five hypotheses studied only hypothesis one was rejected.

In general it may be concluded that varying the numbers of connectives in discourse does not influence the number of propositions nor the number of connectives recalled. Some possible explanations have been put forth in the discussion at the end of each hypothesis. Further possible explanations will be addressed in Chapter V.

Pearson product moment correlations showed few significant relationships between reading achievement and the number of propositions and number of connectives of each category recalled. This may be due to three factors which have been discussed, 1) the infrequent use of some types of connectives in oral language, 2) the oral and written language maturity of

the subjects, and 3) the narrow range of reading achievement within the sample.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

This chapter will consist of a general overview of the study, a further discussion of the findings, implications for teaching, and suggestions for further research.

The Study in Review

The study was designed to test the effects of differing amounts of text information contained in connected discourse on text retrieval. The text information utilized for analysis in this study was that which was developed as part of the Semantic Potential Theory of Language (Fagan, 1978).

Three passages, all similar in content and style were selected from a grade four basal reading series. The passages were re-written in order to maintain the same length in terms of propositions, that is, one hundred propositions each. In order to reflect variation in the amount of text information (referential and logical connectives) contained within each passage, one passage was identified as a "typical" grade four passage in accordance with Adams' (in progress) means for information contained in stories of grade four basal readers. A second passage contained approximately thirty-two percent more referential and logical relations than the "typical" passage, and was labelled the "atypical more" passage. The third passage contained approximately thirty-two percent less referential and logical relations than the "typical" passage and was called the "atypical less" passage. The sample for the study was composed of twenty "average" grade four readers randomly selected from an assigned population of eighty-nine grade four pupils in Edmonton Public Schools. The passages were presented to each subject in random order. Each subject was instructed

to read each passage silently and after each passage had been read to tell the examiner what the passage was about. These recalls were tape-recorded and then transcribed into typed protocols for the purpose of analysis.

The protocols were first divided into T-units and mazes. The mazes were then discarded and the T-units were further divided into propositions. The number of propositions and referential and logical relations in each category were then counted and recorded for computer analysis. The computer analysis consisted of a one-way analysis of variance with repeated measures for each passage. In addition Pearson product moment correlations were calculated for reading achievement and each of the variables in each passage.

Discussion of Findings

The three passages were manipulated to reflect different amounts of information, specifically referential and logical relations. Referential relations consisted of two categories of referential connectives, categories one and two, and logical relations consisted of two categories of logical connectives, categories three and four.

With the exception of category one, referential connectives (pronoun, relative pronoun, complementizer, repetition, and synonym) there was no significant difference in the recalls across the three passages. The adjustment of category two, three and four connectives across the passages did not significantly affect the subject's recall of those passages. Since this study dealt with the recall of manipulated discourse any discussion of the results would be incomplete without addressing the question of what factors influence the difficulty of a passage. This question has been the focus of educational researchers for many years.

Numerous researchers have attempted to derive formulae that would

assess the readability or reading level of a passage. The formulae that have been published consider many factors. However, the most common factors that have appeared in readability formulae since the early 1920's are vocabulary counts, syllable counts and sentence length. Some of these formulae will be discussed here.

Lively and Pressey (1923) in what Klare (1963) calls the first true readability formula considered three factors: (a) the number of different words (b) the index of difficulty assigned to each word, based upon the frequency of each word in Thorndike's Teacher's Word Book, and (c) zero-value words, those not appearing on Thorndike's list of 10,000 Most Common Words. Vogel and Washburne (1928) devised a readability formula that included Lively and Pressey's factors one and three, and they also considered as factors the total number of prepositions and the number of simple sentences in a sample of seventy-five sentences. Gray and Leary (1935) in a landmark study in readability considered five factors to be indicative of the reading level of written material: (a) number of different hard words (those not common to Dale's list of 769 words), (b) percentage of different words, (c) number of personal pronouns, (d) average number of words per sentence, and (e) number of prepositional phrases. They also published an alternative formula which contained the five factors mentioned above as well as three additional factors, (f) the number of easy words found in a passage of one hundred words, (g) the percentage of polysyllables found in a passage and (h) the number of simple sentences used in the passage. Thus Gray and Leary extended the vocabulary count concept to include a measure of sentence length, and a count of syllables. As well by including personal pronouns as a factor they were introducing a referential connective to the readability variable

list. Lorge (1939) also considered vocabulary count, sentence length and prepositional phrases. Perhaps the best known formula for readability was that published by Flesch (1943). He considered three factors: (a) the average sentence length in words, (b) the number of affixes and (c) the number of personal references. Flesch later (1948) derived two separate formulae, one for reading ease, which considered the number of syllables per one hundred words and the average number of words per sentence, and the second as a measure of readability in terms of human interest, which included the number of personal words and number of personal sentences per one hundred sentences as factors. Dale and Chall (1948) also devised a formula that has been widely used to assess readability. They considered average sentence length and percentage of words outside of the Dale list of 3,000 words. Spache's (1953) formula was very similar except word difficulty was defined in terms of the Dale list of 769 words. Many researchers have developed other formulae in more recent years, (Botel, 1962; Fry, 1965; McLaughlin, 1969, etc.) however the factors utilized in these formulae differ little from the earlier formulae.

The major difficulty in readability formulae is that the factors considered consist of isolated bits of linguistic information that is contained in written discourse. If the purpose of reading is to gain understanding from a passage, then a measure of readability must also measure the comprehensibility of a connected passage, for only when a passage is comprehendable for the reader can it be considered readable. Such factors as vocabulary counts, sentence length, syllable counts, etc. do not take into consideration the interaction of linguistic information contained in the text of written material. It is this interaction when perceived and combined with the reader's knowledge and experience that

gives rise to comprehension. This inadequacy of readability formulae as a measure of comprehensibility of a passage prompted the search for other methods of determining the "readability" of passages.

Taylor (1953) developed the cloze procedure as an analytic tool whereby the interaction of language is of prime importance. In order to account for the deleted words in the cloze passage, the reader must recognize the interaction of the language and must call upon his linguistic knowledge. He must also be actively involved in the acquisition of meaning and must utilize whatever contextual clues are present. Because of the nature of the cloze task Taylor and other researchers have demonstrated its viability not only as a measure of "readability" but also as a measure of comprehension. Thus the cloze procedure seems to come closer to the truth about the multiplicity of factors which make a passage readable.

In recent years proponents of discourse analysis have developed theories which propose other factors that may account for the difficulty of passages. Rather than utilizing factors considered in readability studies these researchers have developed theories that tend to view a paragraph or passage as an entity of its own and consequently they also focus upon the interaction of language elements. These researchers tend to analyze discourse in terms of information units and their grammatical relationships and logical structure. Koen, Becker and Young (1969) view a paragraph as a psychological reality composed of three elements, lexical, grammatical and rhetorical. Lexical elements are composed of such devices as word repetition, synonyms, metaphor, paraphrasing and relative and personal pronouns. The grammatical element consists of formal markers and the rhetorical element consists of functional slots forming a pattern or

sequence and filled by one or more sentences. Mosberg and Shima (1969) studied the thematic organization of discourse. Kintsch (1972) studied the propositional organization of discourse as the basis of semantic memory for sentences. The Semantic Potential Theory of Language (Fagan, 1978) looks at linguistic information conveyed in discourse as composed of three major elements, denotational information, relational information, and text relations. It was with this latter element that the present study was concerned.

In addressing the question of what influences the difficulty of a passage, many factors have been suggested by researchers. A study of the literature reveals that results of studies published to this point in time strongly suggest that this question is extremely complex. There appears to be a multitude of factors which play influential roles. These factors seem to be interrelated and interdependent upon many other factors that intervene in the reading act from time to time and from one passage to another. It is only by continued research (both original and replication) that an answer to this question may evolve.

The great multiplicity of factors that the above studies have revealed suggests that the truth can only be found by a strict experimental control of all factors which may intervene. If however one were to attempt to do this it may be difficult to have a true reading situation. It becomes obvious that some factors which were not controlled in the present study may have been influential in nullifying the effects of the connectives utilized in the study, and these factors are hypothesized as affecting the recalls.

The passages chosen for the study were all written in the narrative style. Different styles of writing such as expository or descriptive styles may reflect differing amounts of information in the form of the

connectives studied. The use of many category four connectives (conditional, disjunction, temporal conjunction, contrast, comparison and spatial) for example may be much more frequent in an argumentive discourse since many of these connectives would be used in dealing with the counterbalancing of situations, especially contrast, comparison, and disjunction. Similarly the use of pronominal reference would likely be substantially reduced in expository material. The present study dealt with narrative prose only. The effects of the factors studied in other types of language style is not known. Language style then may be a factor to be considered.

In this study three passages were used, a typical passage and two atypical passages, one of which contained approximately thirty-two percent more referential and logical connectives in each category and one which contained approximately thirty-two percent less referential and logical connectives in each category. The question arises as to whether or not this arbitrarily chosen percentage adjustment reflected enough difference to have had an appreciable effect upon the recalls.

Some of the categories of connectives, most notably those in categories two and four appear to receive minimal usage in grade four basal texts. The means for each connective, as found by Adams (in progress) appear in Table V-1. The minimal usage of some of these connectives combined with the fact that many of them are not "taught" in commercial reading programs may have contributed to the subjects' lack of understanding and lack of use of these connectives in their recalls.

Another factor which may have affected the outcome of this study is the content of the passages. When the reader is engaged in the act of reading he not only brings his linguistic knowledge to the page, but also his total experiential background. This experiential background of the

TABLE V - 1

MEANS FOR REFERENTIAL AND LOGICAL CONNECTIVES PER T-UNIT FOUND IN A SAMPLE OF GRADE FOUR BASAL READERS BY ADAMS

REFERENTIAL CONNECTIVE	MEAN	LOGICAL CONNECTIVE	MEAN
Category 1		Category 3	
PRONOUN	39.694	CONJUNCTION	12.889
RELATIVE PRONOUN		TEMPORAL DISJUNCTION	1.861
COMPLEMENTIZER	N/A*	Category 4	
REPETITION	23.028	DISJUNCTION	1.056
SYNONYM	4.722	TEMPORAL CONJUNCTION	2.194
Category 2		CONDITIONAL	1.778
CLASS INCLUSION	2.278	CONTRAST	2.750
DERIVATION	0.722	COMPARISON	1.944
INCLUSION	0.389	SPATIAL	0.639
FORMAL REPETITION	1.167		

*Adams did not include the complementizer in his analysis.

individual when combined with the print will create certain emotional and cognitive reactions to the passage. These reactions will differ in each individual according to his background experience. Though similar in one aspect of content (human/animal interaction), the three passages differed in specific content which may have given rise to different reactions in each subject, and may have affected the recalls. One passage was about a boy and his dog, one about a woman and her parrot and the third was about some children and their horse. In reading these passages the subject who has lived on a farm or who has had a horse for a pet

would experience a much different reaction to the story than the subject who was city-bound all his life and had never ridden on a horse. This experiential factor and its relationship to story content was not considered in this study although it may have had an effect upon the recalls of various subjects.

A study by Kintsch and Keenan (1973) demonstrated that the hierarchical arrangement of propositions within a passage affected the recalls of the passage. They found that propositions that were written at the superordinate level were recalled significantly more than those propositions at the subordinate level. In the present study, the effects of the different structures of the passages (Appendix D) on the subjects' recalls were not analyzed.

Four of the five null hypothesis investigated in this study were not rejected. However, this may not necessarily mean that the text variables investigated do not make a difference to the amount of information recalled. Some factors which were not controlled in the present study and which may have affected the outcome of this study have been identified and discussed above.

Implications for Teaching

One of the ways in which students learn about the world is simple exposure to its elements. Exposure or experience also has a great effect upon language learning. The results of this study indicate that some of the connectives studied are not used by grade four pupils, and an analysis of commercial materials (Adams, in progress) shows that these pupils receive limited exposure to many of them. The effects of minimal exposure can be counterbalanced to a great degree by direct teaching and usage in oral and written expression. That there is a need for direct teaching

of connectives such as those in categories two and four which appear infrequently in grade four basal readers is one implication of the results of the present study. Robertson (1966) found that students in grade four, five and six experienced difficulty with the connectives "and" and "but" on the Written Connectives Test. This writer has suggested some possible difficulty with use of the temporal disjunction "and then" due to what appears to be duality of purpose in usage. It is therefore further suggested that teachers provide lessons which familiarize pupils with the purpose and use of connectives.

Since the style of language (narrative, expository) seems to determine the kinds of connectives which are present, children should be taught these connectives which are appropriate to specific language situations.

Suggestions For Further Research

1. Just as repetition provides an aid to the reader as he samples print for meaning, so also can replication aid the researcher in establishing validity of knowledge. The replication of studies under different conditions or with slightly differing controls provides a research base upon which our knowledge of the reading process grows.

The present study marks a beginning in the reception half of the Semantic Potential Theory of Language. Only through further research extending from the present study can one receive greater insights into the questions posed by this study. As pointed out earlier in this chapter there were many factors that may have intervened to affect the results of this study. Further research should attempt to study the effects that some of the aforementioned factors may have on text retrieval.

2. Information is needed on whether differing the referential and

logical relations in discourse affects the recalls of readers at different grade levels.

3. The nature of the language style and the effects of differing amounts of referential and logical relations should be studied.

4. The effects of differing amounts of Text Information on readers of different achievement levels could be investigates.

5. The study could be replicated with a different percentage adjustment in the manipulated connectives to determine whether or not there is a threshold level above which the text information has a significant effect upon the retrieval of information.

6. The hierarchical structure of passages (superordinate/subordinate) and its interaction with different types of text clues needs to be investigated.

7. How do high reading achievers process different amounts of Text Information and is there a minimal level necessary for understanding.

8. Will the nature of the directions given to the subjects affect the amount of information recalled.

Conclusion

The results of this study seem to indicate that differing amounts of referential and logical connectives do not for the most part have an appreciable effect upon the retrieval of information from connected discourse. Although the results in this study seem fairly definitive, because of the number of possible influencing factors, much more research must be conducted before a viable knowledge base of passage difficulty is achieved. This is only the beginning, there is much more to be done.

BIBLIOGRAPHY

Adams, Stuart. A description of the Language of Grade 4, 5, and 6 Basal Readers and its Comparison with the Written and Oral Language of 9, 10, and 11 Year Old Children. Master's Thesis, University of Alberta, in progress.

Ames, Wilbur S. The Development of a Classification Scheme of Contextual Aids, Reading Research Quarterly, Fall, 1966, 2, 57-80.

Artley, A. S. Teaching Word Meaning Through Context. Elementary English Review, 1943, 20, 68-74.

Askov, Eunice and Hamm, Karlyn. Context Clues: Should We Teach Children to Use a Classification Scheme in Reading. Journal of Educational Research, May 1976, 69, 341-344.

Bormuth, John R. Readability, A New Approach. Reading Research Quarterly, Spring, 1966, 1, 79-132.

Clark, H. and Clark, E. Psychology and Language, Harcourt, Brace Janovich, Inc. New York, 1977.

Dale, Edgar (ed.) Readability, National Council of Teachers of English, Champaign, Illinois (reprinted from Elementary English, Jan.-May, 1949).

Dale, Edgar and Chall, Jeanne S. A Formula for Predicting Readability, Educational Research Bulletin, 1948, 27, 11-20.

Davis, F. B. Research in Comprehension in Reading. Reading Research Quarterly, 1968, 3, 499-545.

Davis, F. B. Psychometric Research on Comprehension in Reading. Reading Research Quarterly, 1972, 1, 628-678.

Dulin, Kenneth. The Role of Contextual Clues in the Acquisition of Specific Reading Vocabulary by Mature Readers. (Doctoral Dissertation, University of Washington, 1968), Ann Arbor, Michigan, University Microfilms Inc., 1969.

Edmonton Public School District. Edmonton Public Schools Elementary Reading Test - Grade Three, Edmonton: Edmonton Public Schools, June, 1977.

Fagan, W. T. An Investigation into the Relationship Between Reading Difficulty and the Number and Types of Sentence Transformations, Unpublished Doctoral Dissertation, University of Alberta, 1969.

Fagan, W. T. A Comparison of the Oral Language of Children, Ages Nine, Ten, Eleven, Canada Council Research Grant 576-0563, Department of Elementary Education, University of Alberta, January, 1978.

Feifel, H. and Lorge I. Qualitative Differences in Vocabulary Responses in Children. Journal of Educational Psychology, 1950, 41, 1-18.

Ferguson, G. Statistical Analysis in Psychology and Education, (3rd. ed.), Toronto: McGraw-Hill Book Company, 1971.

Foust, Charles David. The Relationship Between Understanding Prepositions and Reading Comprehension, Unpublished Doctoral Dessertation, Ohio State University, 1973.

Glass, G. and Stanley, J. Statistical Methods in Education and Psychology, New Jersey: Prentice-Hall, 1970.

Goodman, Kenneth. Reading: A Psycholinquistic Guessing Game. In H. Singer and R. Ruddell (eds.), Theoretical Models and Processes of Reading, Newark, Delaware: International Reading Association, 1971.

Isakson, Richard and Miller, John. Sensitivity to Syntactic and Semantic Cues in Good amd Poor Comprehenders. Journal of Educational Psychology, Dec. 1976, 68, 787-792.

Kintsch, Walter and Keenan, Janice. Reading Rate and Retention as a Function of the Number of Propositions in the Base Structure of Sentences. Cognitive Psychology, 1973, 5, 257-274.

Kintoch, W., Kozminsky, E., Streby, W. J., McGoon G., and Keenan, J. M. Comprehension and Recall of Text as a Function of Content Variables. Journal of Verbal Learning and Verbal Behavior, 1975, 14, 196-214.

Klare, George R. The Measurement of Readability, Ames, Iowa: Iowa State University Press, 1963.

Klare, George R. Assessing Readability. Reading Research Quarterly, 1974-75, X, No. 1.

Laing, W. W. Ways Readers Process Context to Get Word Meaning, Unpublished Doctoral Dissertation, University of Alberta, 1974.

Lorge, Irving. The Lorge Formula for Estimating Difficulty of Reading Materials, New York: Teachers College Press, Columbia University, 1959.

McCullough, C.M. Learning to use Context Clues. Elementary English Review, 1943, 20, 140-143.

Miller, Larry A. An Investigation into the Relationship of Anaphoric Reference and Reading Comprehension of Grade Two Pupils, Unpublished Doctoral Dissertation, University of Alberta, 1976.

Rankin, Earl and Overholser, Betsy M. Reaction of Intermediate Grade Children to Contextual Clues. Journal of Reading Behavior, 1969, 1, 50-73.

Robertson, J. E. An Investigation of Pupil Understanding of Connectives in Reading, Unpublished Doctoral Dissertation, University of Alberta, 1966.

Smith, F. Understanding Reading, Toronto: Holt, Rinehart and Winston, 1971.

Smith, F. Comprehension and Learning: A conceptual Framework for Teachers. Toronto: Holt, Rinehart and Winston, 1975.

Thorndike, E. L. Reading as Reasoning: A Study of Mistakes in Paragraph Reading. The Journal of Educational Psychology, June, 1917, VIII, No. 6, 323-332.

Winer, B. J. Statistical Principals in Experimental Design (2nd ed.), New York: McGraw-Hill Book Company, 1971.

APPENDIX A

DEFINITIONS AND EXAMPLES OF REFERENTIAL AND LOGICAL CONNECTIVES

REFERENTIAL CONNECTIVES

CATEGORY 1:

Pronoun (pro-form): A pronoun is used to stand for and refer back to a previous antecedent. Pronouns (pro-form) may be personal, demonstrative, possessive.

That guy on the boat ... he
The boy arranged his golf balls on the grass.
A golf cart or something like that

Pronoun (Relative): This includes the relative class of pronouns and are generally used to introduce clauses.

He hunted for golfballs which had fallen into the river.
He recognized the policeman who stood by the stop sign.

Complementizer: A word that introduces a clause complement.

He said that he would arrive early.
Do you know what Dr. Jones wanted?

Repetition: A lexical item itself is repeated and it is meant to refer to the same item previously introduced.

The boy stowed away on the ship.
The dories left the ship one at a time.

Synonym: One lexical item replaces another but is meant to refer to the same object of event. The substituted word is the same part of speech. One class of synonyms is words which might be listed in a dictionary as synonyms. Other words are synonyms only within the particular context, where they refer to the same thing.

ship - boat women - ladies a golf cart or something like that

CATEGORY 2:

Class Inclusion: A noun phrase introduces a subset or a specific instance of a class mentioned previously or names the class of a particular subset already introduced.

The men on the boat. - the man
The men on the boat. - Jack
The dog barked. - The animals on the farm.

Derivation: Two lexical items share the same semantic root and are usually the same part of speech.

golf - golfing festival - festivities

Inclusion: A general word or phrase is used to refer back to and sum up a previous group of words (not a single word) which identify and describe an event or happening.

Women propose on leap year - this custom.
tore up the grass and everything.
They thought they were list - It was frightening.

Formal Repetition: A lexical item is repeated, but it does not refer to the same object or event but instead introduces a different member or subset of the class.

The boy blew the horn - then they heard the ship's horn.
They finally got back to their ship. On the way home they passed a modern ship, a trawler.

LOGICAL CONNECTIVES

CATEGORY 3:

Conjunction: When two clauses are simply joined together in equivalence.

(John has the ball) and (Bill has the bat.)

Temporal Disjunction: One event happens either before or after another event.

After (he studied his French,) (John did his math problems.)
(John washed the dishes) then (took out the trash.)
Before (he took out the trash,) (John washed the dishes.)

And then is taken together and indicates temporal disjunction.

CATEGORY 4:

Disjunction: When one or another event occurs, but not both.

(I may go to the party) or (I may stay home.)

Temporal Conjunction: An event happens at the same time as another event.

While (I am sweeping the porch,) (Mary will wash the car.)

Conditional: Applies to relationships between events where the second event follows from or must be preceded by the first event. This includes cases where the relationship may be causal.

(John came) because (Mary had called him.)
If (it rains) then (the party will be indoors).
(The teenagers threatened to throw his boots in the river) so (he gave them the golf balls.)

If so/and so begins a t-unit it is considered as conjunction: if within a t-unit, it is conditional.

Contrast: Sets one element in contrast or opposition to another. If A not B. Uses connectives like but, although, nevertheless.

(John wanted to go) but (his mother wouldn't let him.)

Comparison: Involves comparing two elements along some dimension, attribute, or property - A more than or less than B. Often the second verb is deleted.

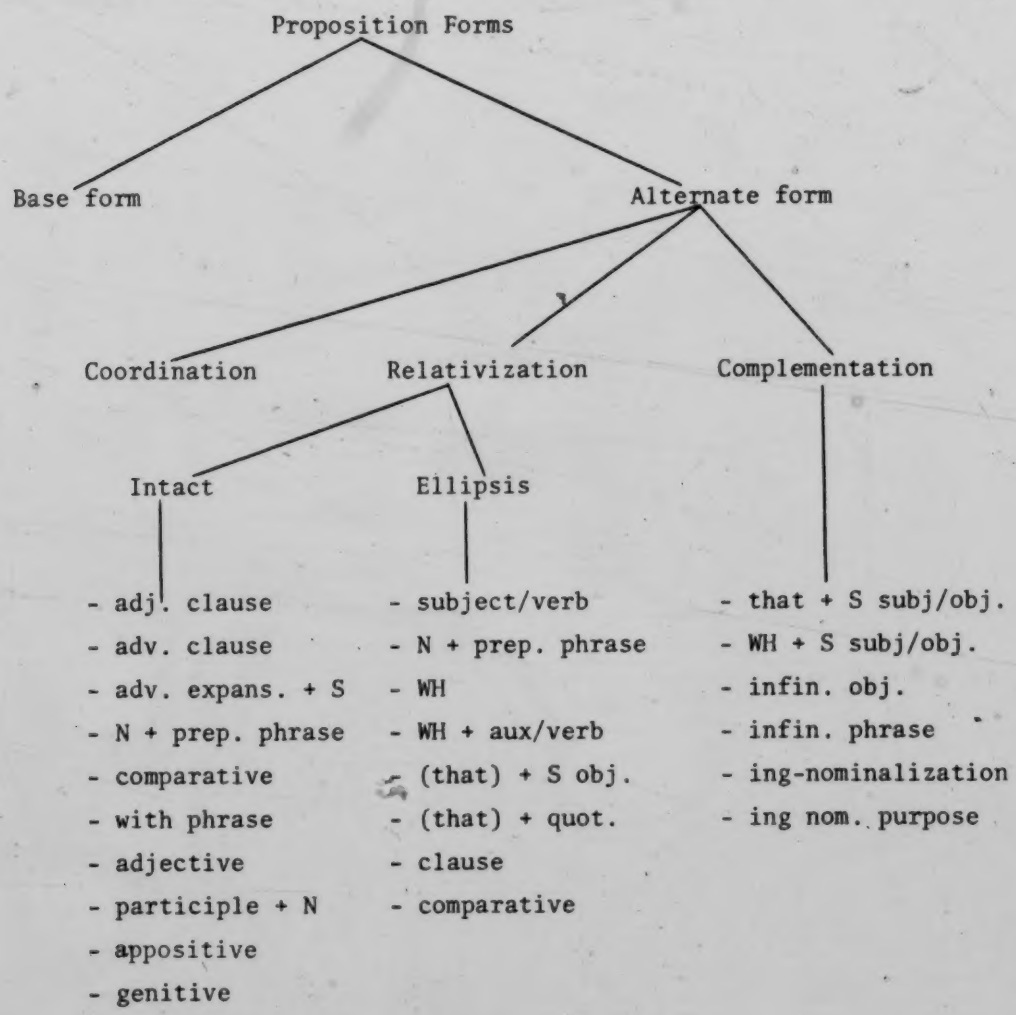
(John is taller) than (Jim . . .)
(He worked) like (a regular crew member.)

Spatial: Indicates place where an event occurred.

(He went) where (the boat was locked.)
(He hid) where (the cook kept his things.)

APPENDIX B

SYNTACTIC FORMS OF PROPOSITIONS


Proposition Forms
Base form
Alternate form
Coordination
Relativization
Complementation
Intact
Ellipsis
- adj. clause
- adv. clause
- adv. expans. + S
- N + prep. phrase
- comparative
- with phrase
- adjective
- participle + N
- appositive
- genitive
- subject/verb
- N + prep. phrase
- WH
- WH + aux/verb
- (that) + S obj.
- (that) + quot.
- clause
- comparative
- that + S subj/obj.
- WH + S subj/obj.
- infin. obj.
- infin. phrase
- ing-nominalization
- ing nom. purpose

SYNTACTIC STRUCTURES*

A syntactic structure may be one of two types.

1. A base t-unit which is the simpliest independent predication which may be used to convey information.

(D) N V (Adj) (Adv) (Adv)	Birds fly
	The horse is black
	Tom works hard
	Mary smiles sweetly
	Mary runs swiftly through the fields
(D) N V (Adj) (N) (N)	Susan eats pie
	Tom forgot his books
	Terry gave the dog a bone
	That woman is a gardener
(D) N V (PP)	The cat is in the house

2. Alternate syntactic structure which with a basic t-unit make up a t-unit and which with the addition or substitution of words could become a basic t-unit. The alternate structures analyzed are:

* These constitute the structural forms in which propositions are expressed.

RELATIVIZATION (INTACT)

Adjective Clause:

I admire my English teacher who is a scholar.

Adverbial Clause:

He hid where the cook keeps the food.
He ran when he was the policeman.
He ran as if his life depended on it.
The teenagers threatened to throw his boots in the water so he threw them his golf balls.

Adverbial Expansion of Man + S:

The lawyer spoke so rapidly that he confused the jury.

Comparative:

He had to work as hard as the other men worked.

With Phrase:

The man with the golf cart started after him.
The teenagers with the car were hunting for golf balls.

Adjective (only in front of the noun):

He was a brave boy.
The sick man could not go out fishing.

Participle + N (only in front of the noun; otherwise it is classed as a WH Auxilliary/verb):

He stood by the closed door.
The howling dog kept me awake all night.
Melting snow causes floods.

Appositive:

The took him to his father, the captain of the ship.

Genitive:

Then they heard the ship's horn.
The captain of the boat said he'd have to work.

RELATIVIZATION (ELLIPSIS)

Subject/verb: The subject or verb is stated for the base t-unit and could be repeated to form another base t-unit.

The room seemed lonely and damp.
He took out a duffle bag and some boots and then turned off the the light.
Some causes of floods are heavy rains, melting snow and rushing streams.

If the expression is considered compound the subject/verb alternate structure does not apply.

More and more snow came down. They put in dykes and stuff.
People can build walls or dykes.

N + Preposition phrase: A preposition phrase follows a noun in the basic t-unit and with the insertion of a verb would become a base t-unit.

I saw the boy on the golf course.
He found the boy in the cupboard.
NOT: He hid in the cupboard.

WH:

He has a book he wants to show you.

WH + Auxiliary/verb:

Then he hopped on this schooner called the Jean Frances.
He saw the boy running through the field.
He saw the water rushing down the hillside.

(That) + S as Object:

I know he is a good fisherman.

That + S as Object quotation (the quotation must contain a verb):

The captain said, "You will have to do your share of work."
The men asked, "How much are you selling the golf balls for?"

Caluse: The marker for a subordinate clause (adverbial, adjective) is omitted.

And the lowlands are the ones which get most water and moisture.
But when it comes and doesn't go away, the water will rise higher and higher.
If it snows lots, stays late and melts quickly, it may flood.
You may prevent floods by planting grass so that the grass will hold the soil in place, so that it won't bring all the soil with it and make the river over flow.

Comparative: The complete base t-unit is not repeated within the comparison but may be inferred.

He had to work just like the other men.
This book is more interesting than that one.

When "like" is used as a preposition and not as a conjunction, the expression does not constitute a comparative.

They may get affected by diseases like cholera.

COMPLEMENTATION

That + S as Object/Subject/Complement:

I believe that he has made the team.
That he has made the team is obvious.
It is surprising that we won the game.
It appeared that she would make it.

WH + S as Object/Subject:

I know what annoys him.
What annoys me most is his arrogance.

Infinitive as Object:

I tried to answer the question correctly.

Infinitive of Purpose:

The exercises are designed to help you.

Ing-Nominalization:

Snow can cause floods by melting too rapidly.

Tom's hot rodding disturbed his mother. She objected to his continuous complaining.

Ing-Nominalization of Purpose:

I have a knack for getting into trouble.

APPENDIX C

INSTRUMENTS

Once upon a time when we lived far out in the country in northern Alberta we had a pretty little bay mare named Jennie.

Jennie was not very big but since she liked to eat and the children used to sneak extra snacks to her, she became very fat. She was almost as wide as she was long.

She had a small dainty head and slender legs. She was really quite clever. Grandfather used to say that she was just plain lazy, but this was not strictly right. She was just smart. She was too smart to let her humans get away with overworking her. So she outsmarted them. She moved slowly and sedately and when anyone tried to make her hurry she used to look at us with those large, soft, brown eyes which said as plainly as she could, "I'm only a little horse and I can't go very fast."

Under her gentle, reproachful gaze what could one do?

Because she was small and slow, Jennie became the school horse. Her duties were to carry the children who were old enough to go to school on her back the three miles to school each morning and three miles home when school closed in the afternoon. The children used to take their lunch with them, along with a bag of oats tied on behind the saddle for Jennie's lunch.

The children would ride double on Jennie in the summer, and in the winter she was harnessed and hitched to a long narrow toboggan upon which the children rode. They were covered up warmly with blankets against the cold. This toboggan was very light and easy for Jennie to pull.

When they reached school in the mornings they would tie up Jennie. At noon they gave her the oats, and then she waited patiently for school to end in the afternoon.

Jennie was always glad when school was over, and she was quite willing to head for home where, she knew, supper and a warm stall would be waiting for her. When it was cold she even consented to increase her speed on the homeward trip. Probably the thought of oats and hay made the difference.

Sometimes in the winter when the weather was very cold - it even went down to forty below zero - the two boys of school age, George and Raymond, needed a lot of blankets to keep them warm.

PASSAGE B Scotty - "Atypical More"

Scotty was a Scottish terrier. He was coal-black and stubby, and he was my dog.

But he almost wasn't. My mother didn't want a dog in the house. That couldn't stop me because the moment I saw Scotty with his intelligent expression, I loved him and wanted him. He wanted me,.too. I could tell by the way he ran to me when he first saw me. He would lick my hands and face and he would jump up and down. Scotty always wore an expression that said, "Take me."

"Can I, please?" I asked my parents but my mother said that she was against it.

I do love her and it's not that she's mean, you understand. It's just because she is a woman and a mother, and because she always worked hard to keep our new home as neat and clean as a pin. That wasn't easy when you lived in a northern Ontario mining town. And that was long ago, before she had all these modern conveniences that mothers have today. That was in 1911.

"Every boy should have a dog," my father said. And since my father's word was law, Scotty became my dog.

But that didn't mean that my mother had to like Scotty. Of course she was never mean or cruel to him, for she wasn't that kind of person. But her expression always seemed to say, "We'll regret having that dog some day. You wait and see. We'll regret it."

And I think Scotty always knew that she felt that way about him because he would watch her very carefully with his big eyes and he would try to be extra-specially good so she would like him. He was very clean and never gave her cause to be angry with him. When his paws were dirty because he was playing outside, he would wait at the

door so he wouldn't track on mother's clean floors. I would have to go wipe the mud off his paws before he came in.

"He's trying to please you," I told my mother. But she wasn't impressed by it.

Scotty learned all kinds of tricks and he would perform them for her even when he was not asked. But she ignored him. It seemed like a contest. My mother was determined not to like Scotty and he seemed equally determined to win her over.

But because I had my dog, I was happy.

PASSAGE C Percy "Atypical Less"

Mrs. Gray was working in the garden, enjoying the afternoon sun, when Percy, her parrot began to raise an awful racket. She looked at the time. "Oh dear, it's two o'clock. He wants to watch television."

She hurried into the house and tried to silence the angry bird. "Really, I don't know why you carry on this way, Percy. Television isn't good for your eyes. A little nap would be better instead."

Percy let out such a loud squawk Mrs. Gray gave in and turned on the set. Right away he began making little cooing noises. "It's a lovely day. It's a lovely day," he cooed in a very sweet voice.

Percy immediately switched attention to the television. His favorite show, The Afternoon Show, was just beginning. It was watched faithfully every day. There were interviews with interesting people and a weather report and at the end was Miss Darlene's Cooking School. Percy liked the cooking part best of all and never got tired of Miss Darlene in a frilly white apron baking pies and cakes and making some delicious new tuna fish casserole.

Mrs. Gray was just about to go outside when the announcer said that today their first guest was to be a Mr. Hawkins, an expert on growing roses. In spite of the fact that there was still work to be done in the garden, she sat down and watched.

Mr. Hawkins certainly knew a lot about flowers and Mrs. Gray agreed with just about everything being talked about. She did feel, however, that one or two important points about caring for roses were left out. She was not surprised when some of his best roses were shown and they turned out to be quite a bit smaller and less healthy looking than the ones growing in her own garden. In fact, only that morning she had given Mrs. Adams, the next-door neighbour, a beautiful bouquet of roses much larger than the ones being shown.

When the interview was over Mrs. Gray stayed on to watch the weather report. She noticed Percy let out delighted little noises at this part. He seemed to like watching the weatherman work behind a glass screen with a large map of the country clearly displayed on it.

APPENDIX D

SUPERORDINATE/SUBORDINATE ANALYSIS OF THE INSTRUMENT

SUPERORDINATE AND SUBORDINATE PROPOSITIONS

Definition

A superordinate proposition introduces a new argument into the text.

A subordinate proposition either repeats an argument already introduced or gives information on an argument already introduced.

A Generalized proposition is one that makes a general statement (without any specific argument). It is usually introduced by words such as you, anyone, one, people. For example: You understand my mother was not mean. You wait and see.

Diagramming

1. The paper is numbered sequentially across the top (horizontally).

   1 2 3 4 5 etc.

2. The subject argument of the proposition is listed first. The remainder of the proposition is considered featural information of the subject argument.

3. Each superordinate proposition is listed at the left of the page. As each new superordinate proposition is introduced it is numbered sequentially, vertically:

   1
   2
   3
   etc.

4. Each repetition of an argument in the superordinate proposition is listed under the superordinate proposition and is designated Level I.

5. A proposition that gives information on an argument in Level 1 is listed under the horizontal 2 and a Level 2 proposition; if a proposition gives information on an argument in a Level 2 proposition it is a Level 3 proposition, and so on. If a subordinate proposition repeats an argument of a proposition already listed, it is entered on the same level.

6. If a proposition contains two arguments referring to arguments in two different propositions already introduced, it is listed under the appropriate level for the first proposition referred to, is starred (*) and is considered a multi-level proposition.

7. When "It" (not a referent) or "There" introduce a proposition, it is listed at the same level as the argument within the proposition, or within the proposition following.

8. Each new proposition, and each reference to a proposition at the same level begins with an upper case letter.

9. A proposition subordinate to an immediately preceding proposition begins with a dash (-) and a lower case letter.

Jennie

1 2 3 4 5 6

1. Once upon a time we had a bay mare

- named Jennie
- pretty
- little

When we lived far out in the country

- in Alberta
- northern

Jennie was not very big
But since she like
To eat

2. The children used to sneak snacks to her

- extra

She became very fat
She was almost as wide
As she was long
She had a head

- small
- dainty

And legs

- slender

She was really quite clever

3. Grandfather used to say

That she was just plain lazy
But this was not strictly right
She was just smart
To let her humans

- get away with
  Overworking her

So she outsmarted them
She moved slowly
And sedately

G When anyone tried
To make her

- hurry

She used to look at us

- with those eyes

1 2 3 4 5 6

- large
- soft
- brown
- which said

- as plainly as she could

I'm only a horse
- little
And I can't go very fast

G What could one do under her gaze

- gentle
- reproachful

Jennie became the school horse
Because she was small
And slow

4. Her duties were

- to carry the children on her back the three miles
- who were old enough
- to go to school
- and three miles home
- when school closed in the afternoon

The children used to take their lunch with them
- along with a bag
- of oats
- tied on behind the saddle for lunch
- Jennie's

The children would ride double on Jennie in the summer

She was harnessed in the winter
And hitched to a toboggan
- long
- narrow
- upon which the children rode

They were covered up warmly
- with blankets against the cold

This toboggan was very light
And easy for Jennie
To pull

1 2 3 4 5 6

They would tie up Jennie
When they reached the school in the morning
They gave her oats at noon
And then she waited patiently
- for school to end in the afternoon

Jennie was always glad
- when school was over
And she was quite willing
To head for home
- where she knew
- supper would be waiting for her
- and a stall
- warm

She even consented
To increase her speed
- on the trip
- homeward

5. Probably the thought made the difference
- of oats
- and hay

The two boys needed a lot of blankets
- George
- Raymond
- of school age
- to keep them warm
- sometimes in the winter when the weather was very cold
- it even went down to forty below zero

Jennie

Summary

Superordinate	5
Generalized	2
Subordinate	
Level 1	8
Level 2	54
Level 3	20
Level 4	9
Level 5	2

Superordinate

1	2	3	4	5
(we)	(children)	(grandfather)	(duties)	(thought)
2	8	2	3	3

Scotty

1 2 3 4 5 6

1. Scotty was a terrier
Scottish
He was coal black
and stubby
and he was my dog
But he almost wasn't

2. My mother didn't want a dog
- in the house
- That couldn't stop me
- because the moment I saw Scotty
- with his expression
- intelligent
- I loved him
- and wanted him

He wanted me too
I could tell by the way
- he ran to me

When he first saw me
He would lick my hands
and face
and he would jump up and down
Scotty always wore an expression
- that said
- take me
- I asked my parents
- Can I please

But my mother said
That she was against it
I do love her

G You understand (something)
It is not
That she's mean
It is just
because she is a woman
And a mother
and because she always worked hard
to keep our home
- new
- as neat
- and clean as a pin

1 2 3 4 5 6

- That wasn't easy

G When you lived in a town
- northern Ontario
- mining
- and that was long ago
before she had all these conveniences
- modern
- that mothers have today
- that was in 1911

3. My father said
- every boy should have a dog

4. Word was law
- my father's
Scotty became my dog
That didn't mean
That my mother had to like Scotty
Of course she was never mean to him
Or cruel
She wasn't that kind of person
But her expression always seemed to say
We'll regret
- having that dog someday

G You want

G And see
We'll regret it

- And I think
Scotty always knew
That she felt that way about him
Because he would watch her very carefully with his eyes
- big
And he would try
to be extra-specially good
so she would like him
He was very clean
And never gave her cause
- to be angry with him

He would wait at the door
When his paws were dirty
because he was playing outside
so he wouldn't track on floors
- mother's
- clean

1 2 3 4 5 6

- I would have to go wipe the mud off his paws
before he came in

I told my mother

He's trying
- to please you
But she wasn't impressed by it

Scotty learned all kinds of tricks
And he would perform them for her
even when he was not asked

But she ignored him

5. It seemed like a contest

My mother was determined
Not to like Scotty

And he seemed equally determined
To win her over

I was happy
Because I had my dog

Scotty

Summary

Superordinate	5
Generalized	4
Subordinate	
Level 1	53
Level 2	22
Level 3	14
Level 4	2
Level 5	1

Superordinate

1	2	3	4	5
(Scotty)	(mother)	(father)	(word)	(contest)
32	20	2	2	1

Percy

1 2 3 4 5 6

1. Mrs. Gray was working in the garden
Enjoying the sun
- afternoon

2. Percy (was) her parrot
Began
To raise a racket
- awful

Mrs. Gray looked at the time
Oh dear, it's two o'clock

Percy wants -
To watch television

Mrs. Gray hurried into the house
She tried
To silence the bird
- angry

Really I don't know, Percy
- why you carry on this way

Television isn't good for your eyes

3. A nap would be better instead
- little

Percy let out a squawk
- loud

Mrs. Gray gave in
*Turned on the set

Right away he began
Making noises
- little
- cooing

1 2 3 4 5 6

He cooed in a voice
- very sweet
- it's a day
  - lovely
- it's a day
  - lovely

*Percy immediately switched attention to the television

4. His show was just beginning
   - favorite
   - Afternoon Show
     - was watched faithfully every day
     - interviews with people
       - interesting
     - a report
       - weather
     - at the end, Miss Darlene's Cooking School

*Percy liked the part best of all
- cooking

He never got tired of Miss Darlene
- in an apron
  - frilly
  - white
- baking pies
- and cakes
- making casseroles
  - delicious
  - new
  - tuna fish

Mrs. Gray was about to go outside

5. The announcer said
   - that today their guest was to be a Mr. Hawkins
     - first
     - an expert on roses
       - growing

Mrs. Gray sat down in spite of work to be done in the garden
And watched Mr. Hawkins knew a lot about flowers

Mrs. Gray agreed with just about everything
- being talked about

1 2 3 4 5 6

She did feel however
- that one or two points were left out
- important
- about caring for roses

She was not surprised
- some of his best roses were shown
- they were smaller
- and less healthy looking than the ones
- growing in her own garden

In fact that morning she had given Mrs. Adams a bouquet
- her neighbour
- next door
- of roses
- beautiful
- much larger than the ones
- being shown

Interview was over

Mrs. Gray stayed on
To watch the report
- weather

She noticed
Percy let out noises at this point
- delighted
- little

He seemed to like
Watching the weatherman
- work behind a screen
- glass
- with a map
- large
- of the country
- clearly displayed on it

Percy

Summary

Superordinate	5
Generalized	0
Subordinate	
Level 1	32
Level 2	29
Level 3	19
Level 4	9
Level 5	2
Level 6	1
Multilevel	3

Superordinate (no. of propositions)

1	2	3	4	5
(Mrs. Gray)	(Percy)	(Nap)	(Show)	(Announcer)
19	16	2	6	2